

REMARKS

By this amendment, Applicants have amended Figure 1 to remove the shaded region so as not obscure reference numerals 3, 4, 11 and 18, as required by the Examiner in numbered section 2 of the Office Action.

Applicants have also amended claim 16 to eliminate the improper Markush language.

In view of the foregoing amendments to Figure 1, reconsideration and withdrawal of the objection to the drawings in numbered section 2 of the Office Action are requested.

In view of the foregoing amendment to claim 16, it is submitted that claim 16 complies with requirements of 35 U.S.C. 112, second paragraph. Therefore, reconsideration and withdrawal of the rejection of claim 16 under 35 U.S.C. 112, second paragraph are requested.

Claims 1-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,462,721 to Pounds et al. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a method for treating a natural gas containing H₂S. The method comprises at least two steps. First, the natural gas is contacted with a first solvent comprising amine so as to obtain an H₂S-depleted gas and an H₂S laden solvent. However, after this first contact, the gas does not conform to the water specification. That is, the gas has absorbed water contained in the first solvent during the first contact. Therefore, the gas must be dehydrated before use.

The second step of the method is carried out in order to dehydrate the gas. That is, the gas is contacted with a second solvent comprising at least 90% by weight of amine so as to obtain a water-depleted gas and a water-laden solvent.

After this second contact, the gas is water-depleted, that is, the water is absorbed by the second solvent.

The method according to the present invention can be carried out with a single circuit of solvent, i.e., the first and second solvent can be issued from the same single circuit, the second solvent being obtained at a higher purity than the first solvent.

The Pounds et al. patent discloses a hydrogen sulfide scavenging process. It is disclosed that the levels of hydrogen sulfide and or organic sulfides present in gaseous or liquid hydrocarbon streams or mixtures thereof are reduced by contacting the streams with a composition comprising the reaction product of aminoethylpiperazine, an alkanolamine, an etheramine, a polyalkylenearmine, or a polyoxyalkyleneamine with C1 to C4 aldehyde. The solubility of polyamine/aldehyde reaction products is increased by the presence of an enhancing amine/aldehyde reaction product.

A first difference between the present invention and the process of Pounds et al. is that the present invention proposes to contact the gas with a solvent comprising an amine whereas the Pounds et al. patent proposes to contact the gas with a composition comprising the reaction product of a dialdehyde and an alkanolamine. The reaction product of a dialdehyde and an alkanolamine is clearly different from an amine. Pounds et al. mention, at column 6, lines 18-20, one of the components of the reaction: the monoethanolamine. This solution containing about 85% monoethanolamine in water reacts with a solution containing about 40% ethanedial in water (see column 6, lines 10-15) in order to form the reaction product contacted with the gas. Therefore, the present invention is not disclosed by Pounds et al.

A second difference between the present invention and the process of Pounds et al. is that Pounds et al performs only a single contact whereas, according to our invention, the gas is contacted with a first solvent then with a second solvent different from the first solvent. According to the present invention, the second solvent absorbs the water contained in the gas. The Pounds et al. patent does not give any motivation to perform a second contact. Further, Pounds et al. does not suggest using a specific solvent, i.e., a solvent comprising more than 90% weight of amine in order to absorb the water. Therefore, the present invention would not have been obvious for one skilled in the art in view of the teachings of Pounds et al.

Claim 16 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Pounds in view of U.S. Patent 5,622,681 to Grierson et al. Applicants traverse this rejection and request reconsideration thereof.

The deficiencies of Pounds et al. are noted above.

The Grierson et al. patent discloses a dialysis separation of heat stable organic amine salts in an acid gas absorption process. While the Grierson patent discloses that methyldiethanolamine is an example of an alkanolamine compound, the teachings of Grierson et al. would not have remedied the basic deficiencies noted above with respect to Pounds et al. Even if one of ordinary skill in the art were to use the compounds disclosed in Grierson in the process of Pounds et al., it is noted that the Pounds et al. patent discloses contacting the gas with the reaction product of a dialdehyde and an alkanolamine, not the alkanolamine itself. Accordingly, claim 16 is patentable over the proposed combination of references.

Applicants note the Examiner has cited a number of documents as being pertinent to Applicants' disclosure. However, since these products were not applied

and rejecting claims formerly in the application, further discussions of these documents is deemed unnecessary.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 612.43291X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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Amendments to the Drawings:

Figure 1 has been amended to remove the shading so as not obscure the reference numerals 3, 4, 11 and 18.

Attachment: Replacement Sheet